

InSight Mission Update

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- The InSight spacecraft is just now finishing its 914th sol on Mars and is still operating almost flawlessly. Our extended mission began at the beginning of December.
- All instruments and sensors are still operating at full capability, with the exception of the heat flow portion of the HP³.
 - The HP³ mole failed to penetrate beyond ~45 cm; recovery activities were abandoned in January.
- InSight is experiencing anticipated solar energy issues due to dust.
- InSight has satisfied all of its Level 1 requirements (essentially crust, mantle and core structure).
- All data is being released through the PDS within 3-6 months of acquisition. Raw images are released within minutes of receipt on the ground.

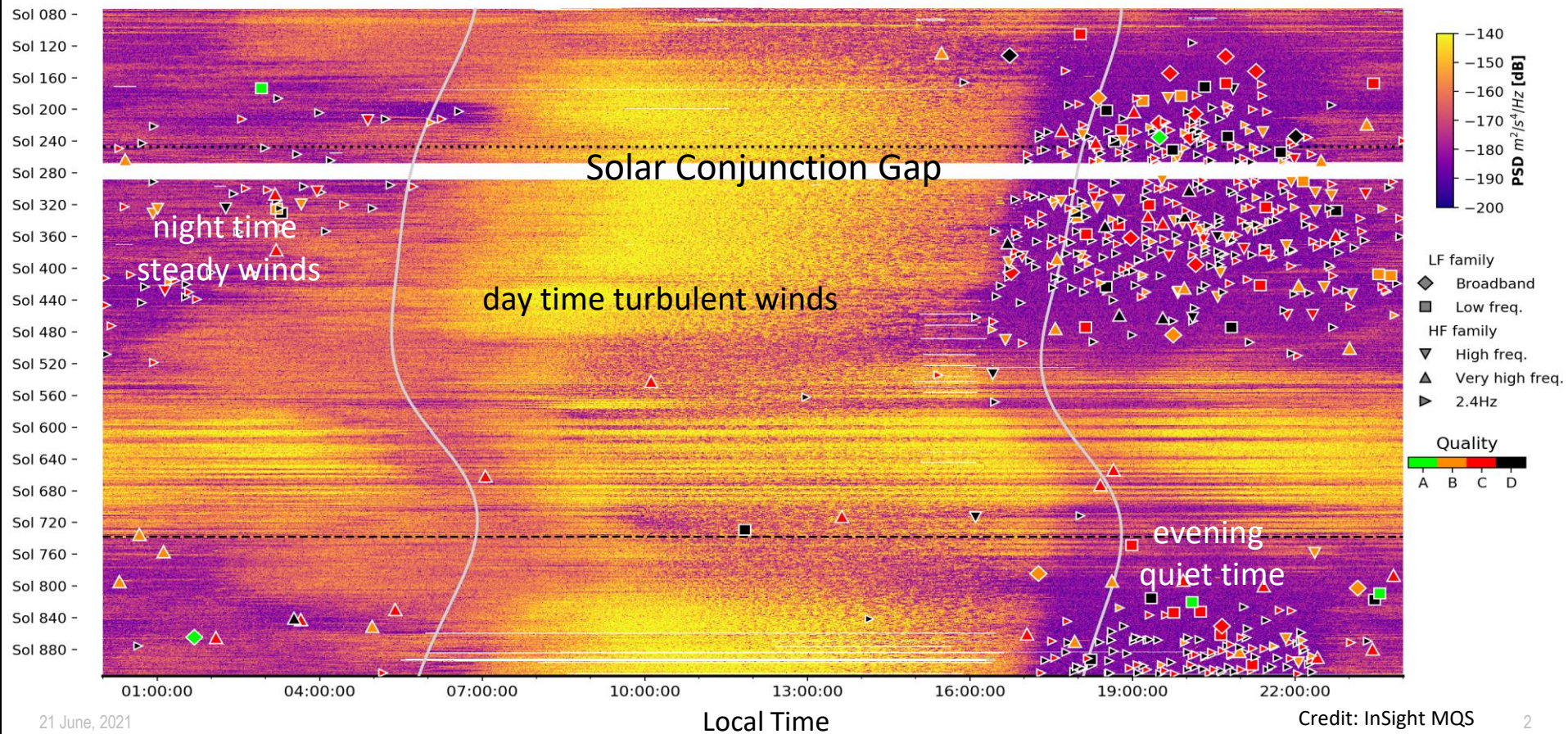
All Seismic Data as of Yesterday (Sol 913)

Sols: 72-913

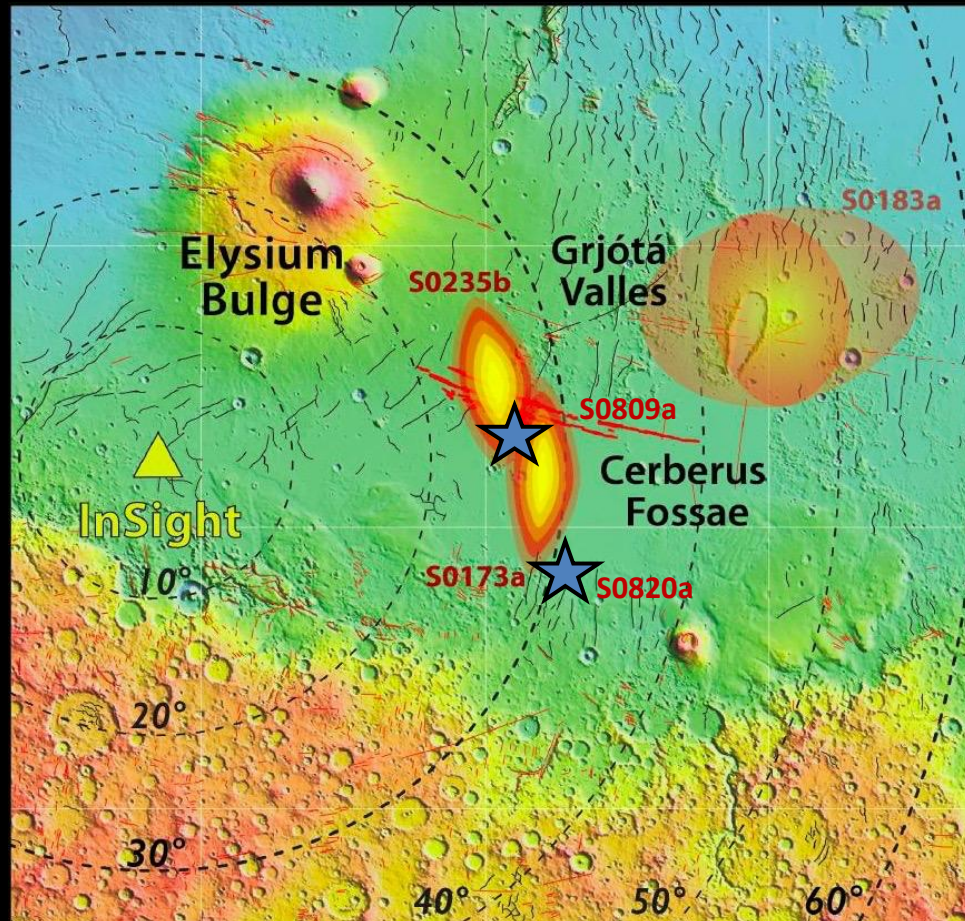
58.BZC,02.BHZ,03.BHZ

Sunrise

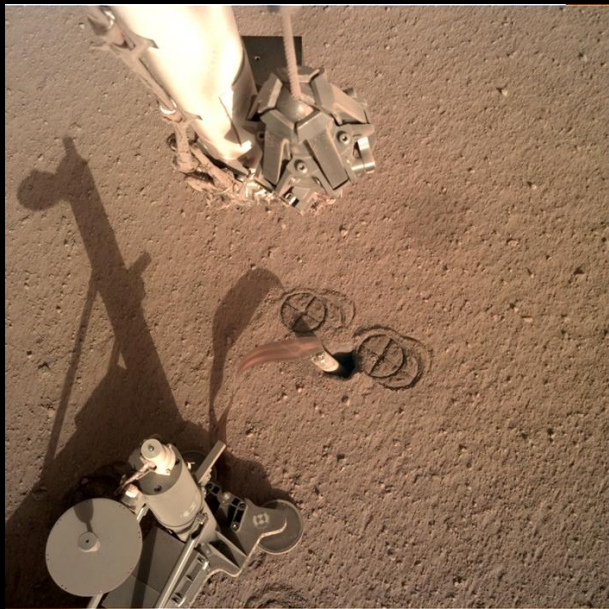
Sunset



- Currently there are 630 events in the InSight catalog.
 - 5 Quality A
 - » Clear seismic phases (e.g. P and S) and polarization
 - 106 Quality B
 - » Signal clearly observed, clear seismic phases, but no polarization
 - 176 Quality C
 - » Signal clearly observed, but no clear phases
 - 243 Quality D
 - » Signal only weakly observed
 - » OR likely not a seismic event
 - » OR signal possibly contaminated by environmental conditions
- Virtually all of the Qual A and B, and many of the Qual C have been identified by the InSight MQS as tectonic quakes.
- Many (most?) of the remaining events are also likely tectonic in origin.



Mole position after initial hammering



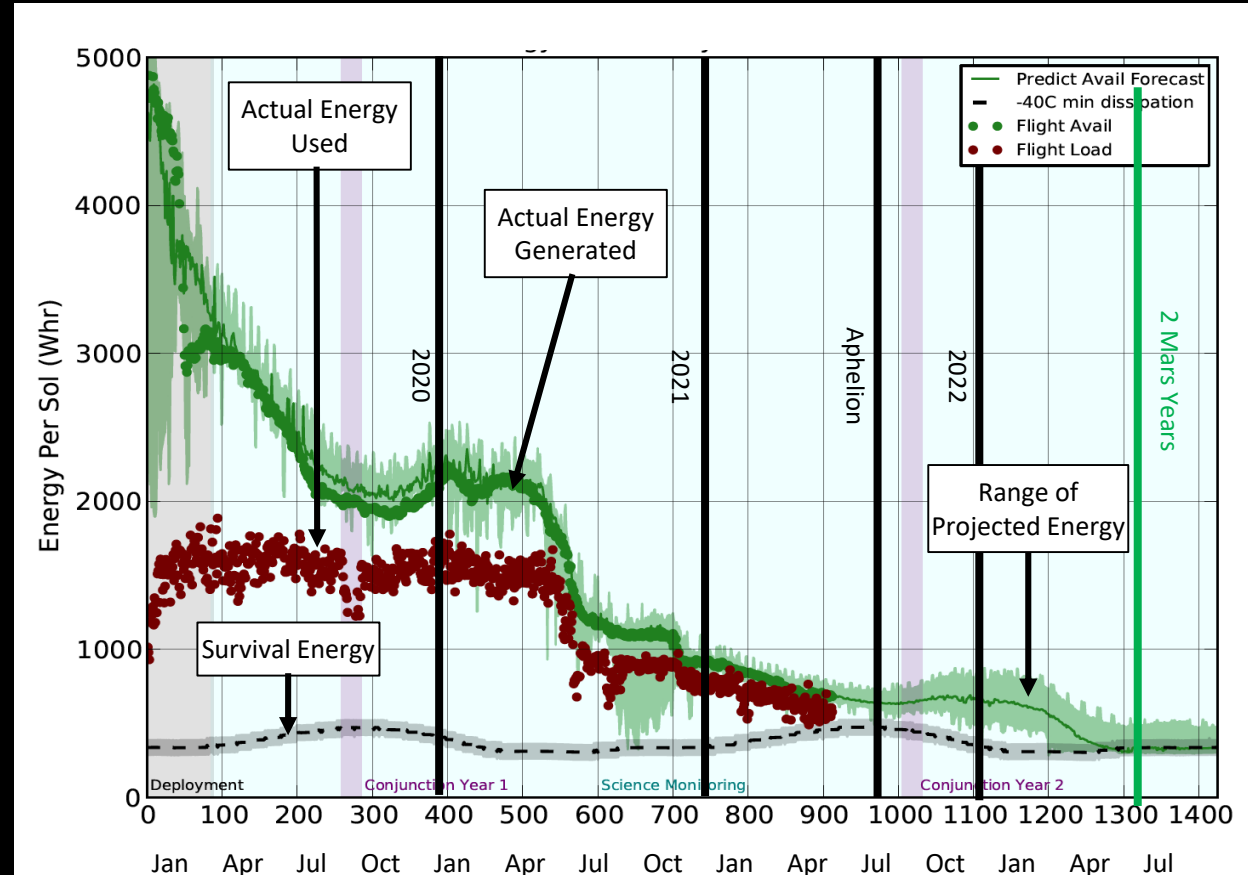
Current buried configuration

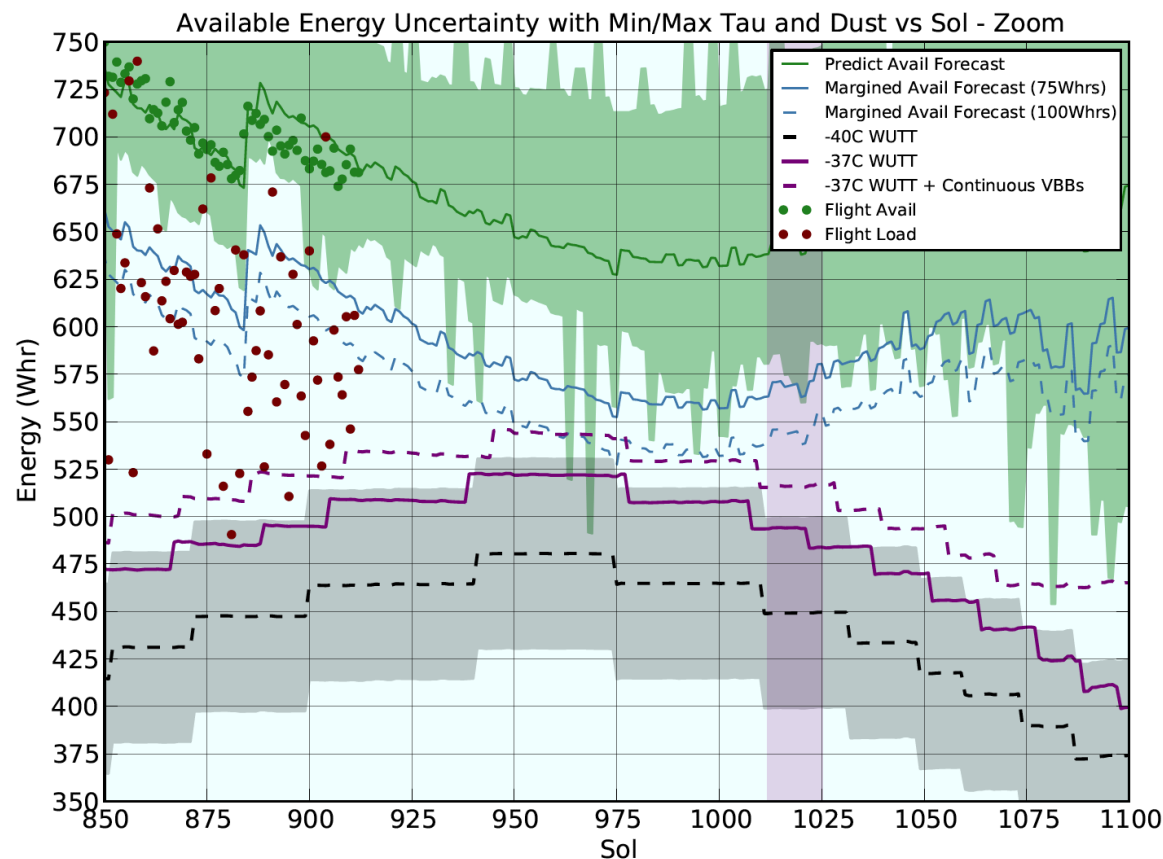


- The thermal gradient experiment has been abandoned. However, the instrument can still measure the thermal conductivity of the upper ~50cm of the regolith.
- The Radiometer portion of the instrument is continuing to periodically measure the IR surface brightness, yielding surface temperature and thermal inertia over the course of the martian year.

- Dust accumulation on the solar arrays has been considerable (~80% obscuration), and is continuing. This is in line with predictions.
 - InSight has not experienced any natural cleaning events. This is not in line with expectations.
 - We are approaching aphelion, which represents the minimum insolation and the minimum temperatures over the martian year.
- The seismometer is continuing to operate around the clock on sols that do not have special activities. Most other sensors have been turned off or are being operated sporadically.

- As Mars approaches aphelion both temperature and available solar power will reach their lowest values.
- We have been rationing on-time for the instruments to accommodate the energy decreases.
- We may have to power of the entire payload for some period around aphelion.
- Unless we can significantly increase the output of the solar arrays, the end of mission may occur sometime around the middle of next year.





- The InSight science team has three papers scheduled for publication July 23 in Science.

Knapmeyer-Endrun et al., Thickness and structure of the Martian crust from InSight seismic data

Khan et al., Upper mantle structure of Mars from InSight seismic data

Stähler et al., Seismic detection of the Martian core

- These papers represent the culmination of three decades of planning and effort to fly a mission to study the deep interior of Mars.
- Details are embargoed until the publication date

Sunset over Elysium, sol 145

